

General

Guideline Title

Vasectomy: AUA guideline.

Bibliographic Source(s)

Sharlip ID, Belker AM, Honig S, Labrecque M, Marmar JL, Ross LS, Sandlow JI, Sokal DC. Vasectomy: AUA guideline. Linthicum (MD): American Urological Association Education and Research, Inc. (AUA); 2012 May. 57 p. [275 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Definitions for the body of evidence strength (grade A, B, or C), the strength of the recommendations (Standard, Recommendation, Option), and for statements labeled as Clinical Principle and Expert Opinion are provided at the end of the "Major Recommendations" field.

Preoperative Practice

Guideline Statement 1. A preoperative interactive consultation should be conducted, preferably in person. If an in-person consultation is not possible, then preoperative consultation by telephone or electronic communication is an acceptable alternative. *Expert Opinion*

Guideline Statement 2. The minimum and necessary concepts that should be discussed in a preoperative vasectomy consultation include the following: *Expert Opinion*

- Vasectomy is intended to be a permanent form of contraception.
- Vasectomy does not produce immediate sterility.
- Following vasectomy, another form of contraception is required until vas occlusion is confirmed by post-vasectomy semen analysis (PVSA).
- Even after vas occlusion is confirmed, vasectomy is not 100% reliable in preventing pregnancy.
- The risk of pregnancy after vasectomy is approximately 1 in 2,000 for men who have post-vasectomy azoospermia or PVSA showing rare non-motile sperm (RNMS).
- Repeat vasectomy is needed in $\leq 1\%$ of vasectomies, provided that a technique for vas occlusion known to have a low occlusive failure rate has been used.
- Patients should refrain from ejaculation for approximately one week after vasectomy.
- Options for fertility after vasectomy include vasectomy reversal and sperm retrieval with in vitro fertilization. These options are not always successful, and they may be expensive.

- The rates of surgical complications such as symptomatic hematoma and infection are 1-2%. These rates vary with the surgeon's experience and the criteria used to diagnose these conditions.
- Chronic scrotal pain associated with negative impact on quality of life occurs after vasectomy in about 1-2% of men. Few of these men require additional surgery.
- Other permanent and non-permanent alternatives to vasectomy are available.

Guideline Statement 3. Clinicians do not need to routinely discuss prostate cancer, coronary heart disease, stroke, hypertension, dementia, or testicular cancer in pre-vasectomy counseling of patients because vasectomy is not a risk factor for these conditions. *Standard (Evidence Strength: Grade B)*

Guideline Statement 4. Prophylactic antimicrobials are not indicated for routine vasectomy unless the patient presents a high risk of infection. *Recommendation (Evidence Strength: Grade C)*

Techniques for Local Anesthesia

Guideline Statement 5. Vasectomy should be performed with local anesthesia with or without oral sedation. If the patient declines local anesthesia or if the surgeon believes that local anesthesia with or without oral sedation will not be adequate for a particular patient, then vasectomy may be performed with intravenous sedation or general anesthesia. *Expert Opinion*

Vas Isolation

Guideline Statement 6. Isolation of the vas should be performed using a minimally-invasive vasectomy (MIV) technique such as the no-scalpel vasectomy (NSV) technique or other MIV technique. *Standard (Evidence Strength: Grade B)*

Vas Occlusion*

Guideline Statement 7. The ends of the vas should be occluded by one of three divisional methods:

1. Mucosal cautery (MC) with fascial interposition (FI) and without ligatures or clips applied on the vas
2. MC without FI and without ligatures or clips applied on the vas
3. Open ended vasectomy leaving the testicular end of the vas unoccluded, using MC on the abdominal end and FI

OR by the non-divisional method of extended electrocautery. *Recommendation (Evidence Strength: Grade C)*

* In this guideline, vas occlusion means that the vas has been completely divided with or without excision of a vas segment, unless otherwise noted. Further, in this document, division/excision (D/E) means that the vas is divided and that a segment may or may not be excised. The panel found no consistent evidence indicating that division with excision of a short vas segment (<4 cm) is preferable to division without excision of a vas segment.

Guideline Statement 8. The divided vas may be occluded by ligatures or clips applied to the ends of the vas, with or without FI, and with or without excision of a short segment of the vas, by surgeons whose personal training and/or experience enable them to consistently obtain satisfactory results with such methods. *Option (Evidence Strength: Grade C)*

Guideline Statement 9. Routine histologic examination of the excised vas segments is not required. *Expert Opinion*

Postoperative Practice

Guideline Statement 10. Men or their partners should use other contraceptive methods until vasectomy success is confirmed by PVSA. *Clinical Principle*

Guideline Statement 11. To evaluate sperm motility, a fresh uncentrifuged semen sample should be examined within 2 hours after ejaculation. *Expert Opinion*

Guideline Statement 12. Patients may stop using other methods of contraception when examination of one well-mixed, uncentrifuged, fresh post-vasectomy semen specimen shows azoospermia or only rare non-motile sperm (RNMS or $\leq 100,000$ non-motile sperm/mL). *Recommendation (Evidence Strength: Grade C)*

Guideline Statement 13. Eight to sixteen weeks after vasectomy is the appropriate time range for the first PVSA. The choice of time to do the first PVSA should be left to the judgment of the surgeon. *Option (Evidence Strength: Grade C)*

Guideline Statement 14. Vasectomy should be considered a failure if any motile sperm are seen on PVSA at six months after vasectomy, in which case repeat vasectomy should be considered. *Expert Opinion*

Guideline Statement 15. If $>100,000$ non-motile sperm/mL persist beyond six months after vasectomy, then trends of serial PVSAs and clinical

judgment should be used to decide whether the vasectomy is a failure and whether repeat vasectomy should be considered. *Expert Opinion*
(Evidence Strength: Grade C)

Definitions:

Body of Evidence Strength

Grade A: Well-conducted randomized controlled trials (RCTs) or exceptionally strong observational studies

Grade B: RCTs with some weaknesses of procedure or generalizability or generally strong observational studies

Grade C: Observational studies that are inconsistent, have small sample sizes, or have other problems that potentially confound interpretation of data

American Urological Association (AUA) Nomenclature Linking Statement Type to Evidence Strength

Standard: Directive statement that an action should (benefits outweigh risks/burdens) or should not (risks/burdens outweigh benefits) be taken based on Grade A or B evidence

Recommendation: Directive statement that an action should (benefits outweigh risks/burdens) or should not (risks/burdens outweigh benefits) be taken based on Grade C evidence

Option: Non-directive statement that leaves the decision regarding an action up to the individual clinician and patient because the balance between benefits and risks/burdens appears equal or appears uncertain based on Grade A, B, or C evidence

Clinical Principle: A statement about a component of clinical care that is widely agreed upon by urologists or other clinicians for which there may or may not be evidence in the medical literature

Expert Opinion: A statement, achieved by consensus of the Panel, that is based on members' clinical training, experience, knowledge, and judgment for which there is no evidence

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Unintended pregnancy

Guideline Category

Counseling

Evaluation

Management

Treatment

Clinical Specialty

Anesthesiology

Family Practice

Internal Medicine

Surgery

Urology

Intended Users

Advanced Practice Nurses

Patients

Physician Assistants

Physicians

Guideline Objective(s)

- To provide guidance to clinicians who offer vasectomy services
- To provide a set of approaches and procedures that maximizes successful vasectomy outcomes and minimizes failure and other adverse events

Target Population

Men who are undergoing or considering vasectomy

Interventions and Practices Considered

Preoperative Practice

1. Preoperative interactive consultation discussing risks and benefits of vasectomy and alternatives to vasectomy
2. Use of prophylactic antimicrobials (not recommended routinely)

Operative Practice

1. Techniques for local anesthesia
 - Performing vasectomy with local anesthesia with or without oral sedation (preferred)
 - Performing vasectomy with intravenous sedation or general anesthesia when indicated
2. Isolation of the vas using a minimally-invasive vasectomy (MIV) technique such as the no-scalpel vasectomy technique
3. Vas occlusion
 - Mucosal cautery (MC) with fascial interposition (FI) and without ligatures or clips applied on the vas
 - MC without FI and without ligatures or clips applied on the vas
 - Open ended vasectomy leaving the testicular end of the vas unoccluded, using MC on the abdominal end and FI
 - Non-divisional method of extended electrocautery
4. Routine histologic examination of excised vas segments (not recommended)

Postoperative Practice

1. Counseling men or their partners to use other contraceptive methods until vasectomy success is confirmed by post-vasectomy semen analysis (PVSA)
2. Time frame and technique for PVSA
3. Considerations for repeat vasectomy

Major Outcomes Considered

- Ease/difficulty of making a decision about vasectomy
- Effectiveness of vasectomy
- Vasectomy failure/success rate
- Degree of pain
- Short-term and long-term complications of vasectomy
- Other outcomes potentially associated with vasectomy (e.g., coronary heart disease, stroke, prostate and testicular cancer, sexual outcomes, psychosocial outcomes)
- Patient satisfaction or regret
- Timing of sperm clearance after vasectomy
- Sensitivity of post-vasectomy semen analysis (PVSA)

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

A systematic review was conducted to identify published articles relevant to key questions specified by the Panel (see Appendix C of the original guideline document for key questions). The key questions focused on identifying necessary elements of pre-operative evaluation and consultation, optimal procedures for anesthetic administration, the least traumatic and most effective procedures for isolation of the vas deferens during vasectomy, the most effective procedures for occluding the vas deferens during vasectomy, the complications and consequences of vasectomy and the necessary components of post-operative follow-up, including semen analysis to verify sterility.

Literature searches were performed using the MEDLINE® and POPLINE® databases from January 1949 to August 2011 with the goal of identifying literature broadly relevant to the practice of vasectomy.[†] This literature included studies that focused on the prevalence of vasectomy; the demographics of patients and couples who chose vasectomy; vasectomy operative techniques, including techniques for vas isolation and vas occlusion and associated failure rates; short-term and long-term complications of vasectomy, other outcomes potentially associated with vasectomy (e.g., coronary heart disease, stroke, prostate and testicular cancer, sexual outcomes, psychosocial outcomes) and post-vasectomy semen analysis (PVSA) procedures and timing. Inclusion criteria for operative procedures were conventional vasectomy (CV) and minimally-invasive vasectomy (MIV), including the no-scalpel vasectomy (NSV) technique. Any method for occluding the vas was included. The following topics were excluded from the scope of the review: laparoscopic vasectomy, vasectomy reversal, post-vasectomy options for pregnancy, treatment of post-vasectomy pain syndrome, examination of antibodies to antigens other than sperm post-vasectomy and techniques for teaching vasectomy. Articles on antibiotic prophylaxis also were excluded as the topic of antibiotic prophylaxis in surgical procedures without entering the urinary tract is covered in an American Urological Association (AUA) Best Practice Policy (<http://www.auanet.org/content/media/antimicroprop08.pdf>). All settings and all ages of vasectomy patients were included. All study designs were included except for single-group cohort studies on immediate post-operative complications with fewer than 500 participants. Review article references were checked to ensure inclusion of all possibly relevant studies. Multiple reports on the same patient group were carefully examined to ensure inclusion of only non-redundant information.

Nearly two thousand citations were reviewed by title and/or abstract. After application of inclusion and exclusion criteria, 275 articles were chosen to form the evidence base of this Guideline.

[†]Search strategy: MEDLINE (PubMed): ("vasectomy"[Text Word]) OR (vasectomy[MeSH Terms]) AND ("1949"[Publication Date]: "2011/08/31"[Publication Date]) Limits: only items with links to full text, Humans, Male POPLINE: (vasectomy/male sterilization); limited to peer reviewed journals.

Number of Source Documents

After application of inclusion and exclusion criteria, 275 articles were chosen to form the evidence base of this guideline.

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Body of Evidence Strength

Grade A: Well-conducted randomized controlled trials (RCTs) or exceptionally strong observational studies

Grade B: RCTs with some weaknesses of procedure or generalizability or generally strong observational studies

Grade C: Observational studies that are inconsistent, have small sample sizes, or have other problems that potentially confound interpretation of data

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Data were extracted on study design (e.g., randomized controlled trial, comparative observational study, case-series); pre-operative, operative and post-operative parameters; complications and other consequences of vasectomy (e.g., patient satisfaction, patient regret) and vasectomy effectiveness and failure rates.

Quality of Individual Studies and Determination of Evidence Strength

Quality of individual studies that were randomized controlled trials (RCTs) or comparative observational studies was assessed using the Cochrane Risk of Bias tool. Since there is no widely-accepted quality assessment tool for single-cohort observational studies, the quality of these studies was not assessed.

The categorization of evidence strength is conceptually distinct from the quality of individual studies. Evidence strength refers to the body of evidence available for a particular question and includes consideration of study design; individual study quality; the consistency of findings across studies; the adequacy of sample sizes and the generalizability of samples, settings and treatments for the purposes of the Guideline (see the "Rating Scheme for the Strength of Evidence" field).

Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

The Vasectomy Panel was created in 2008 by the American Urological Association Education and Research, Inc. (AUA). The Practice Guidelines Committee (PGC) of the AUA selected the Panel Chair and Vice Chair who in turn appointed the additional panel members, all of whom have specific expertise with regard to vasectomy. Membership of the panel included urologists, family medicine physicians, and other clinicians with specific expertise on vasectomy techniques.

The publications identified through literature search were used to create the evidence-based portion of the guideline. For some clinical issues, there was little or no evidence from which to construct evidence-based statements. Where gaps in the evidence existed, the Panel provides guidance in the form of Clinical Principles or Expert Opinion with consensus achieved using a modified Delphi technique if differences of opinion existed among Panel members.

Rating Scheme for the Strength of the Recommendations

The American Urological Association (AUA) nomenclature system explicitly links statement type to body of evidence strength and the Panel's judgment regarding the balance between benefits and risks/burdens.

AUA Nomenclature Linking Statement Type to Evidence Strength

Standard: Directive statement that an action should (benefits outweigh risks/burdens) or should not (risks/burdens outweigh benefits) be taken based on Grade A or B evidence

Recommendation: Directive statement that an action should (benefits outweigh risks/burdens) or should not (risks/burdens outweigh benefits) be taken based on Grade C evidence

Option: Non-directive statement that leaves the decision regarding an action up to the individual clinician and patient because the balance between benefits and risks/burdens appears equal or appears uncertain based on Grade A, B, or C evidence

Clinical Principle: A statement about a component of clinical care that is widely agreed upon by urologists or other clinicians for which there may or may not be evidence in the medical literature

Expert Opinion: A statement, achieved by consensus of the Panel, that is based on members' clinical training, experience, knowledge, and judgment for which there is no evidence

Cost Analysis

Published cost analyses were reviewed:

- Compared to tubal sterilization, which is the other method of permanent contraception, vasectomy is equally effective in preventing pregnancy; however, vasectomy is simpler, faster, safer, and less expensive. Vasectomy is one of the most cost-effective methods of contraception; its cost is about one-fourth of the cost of tubal sterilization. Vasectomy requires less time off work, requires only local rather than general anesthesia, and is usually performed in a doctor's office or clinic.
- Given that vasectomy and tubal sterilization have equivalent contraceptive effectiveness and that vasectomy enjoys advantages compared to tubal sterilization of lower cost, less pain, greater safety, and faster recovery, vasectomy should be considered for permanent contraception much more frequently than is the current practice in the United States and most nations of the world.
- Options for fertility after vasectomy include vasectomy reversal and sperm retrieval with in vitro fertilization. These options are not always successful, and they may be costly.

Method of Guideline Validation

Peer Review

Description of Method of Guideline Validation

The American Urological Association (AUA) conducted an extensive peer review process. The initial draft of this Guideline was distributed to 72 peer reviewers; 55 responded with comments. The panel reviewed and discussed all submitted comments and revised the draft as needed. Since the changes were substantial, a second draft was circulated to 64 peer reviewers. The panel reviewed and discussed all submitted comments in response to this second round of peer review and again revised the document. Once finalized, the Guideline was submitted for approval to the Practice Guidelines Committee (PGC). It was then submitted to the AUA Board of Directors for final approval. The Guideline was approved by the AUA Board of Directors May 2012.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for most treatment recommendations (see the "Major Recommendation" field). Where evidence was lacking, recommendations are supported by expert opinion or consensus.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate preoperative evaluation for and management of vasectomy

Potential Harms

- The rates of surgical complications such as symptomatic hematoma and infection are 1-2%. Rates vary with the surgeon's experience and the criteria used to diagnose these conditions.
- Risk factors for infection following vasectomy include advanced age, anatomic anomalies of the urinary tract, poor nutritional status, smoking, chronic corticosteroid use, immunodeficiency, distant co-existent infection, and prolonged hospitalization. The Panel believes that diabetes is also a risk factor for post-operative infection. The opinion of the Panel is that the presence of one or more of these infection risk factors does not necessarily require the use of antimicrobial prophylaxis. When operating on certain patients who present with comorbidities associated with a particularly high risk of infection, the surgeon should consider the use of prophylactic antimicrobials.
- See the original guideline document for a discussion of long-term postoperative complications, which include the following:
 - Epididymitis
 - Sperm granuloma
 - Dissatisfaction and regret
 - Urolithiasis
 - Impaired fertility due to anti-sperm antibodies
 - Pathological testicular changes after vasectomy
- Chronic scrotal pain associated with negative impact on quality of life occurs after vasectomy in about 1-2% of men. Few of these men require additional surgery.
- The risk of pregnancy after vasectomy is approximately 1 in 2,000 for men who have post-vasectomy azoospermia.
- Repeat vasectomy is needed in $\leq 1\%$ of vasectomies, provided that a technique for vas occlusion known to have a low occlusive failure rate has been used.
- See the original guideline document for discussion of failure rates of various vasectomy procedures

Contraindications

Contraindications

- The surgeon performing vasectomy should obtain a general medical history, with particular emphasis on bleeding diatheses and other possible contraindications to surgery. For example, if a patient requires chronic anticoagulation and the risks of stopping anticoagulation are significant, then the surgeon and patient should consider alternative methods of family planning.
- Physical examination at the time of in-person preoperative consultation is highly desirable because it will identify genital pathology, such as a testis tumor or undescended testis, which would contraindicate routine bilateral vasectomy. In addition, physical examination may identify patients who are not good candidates for local anesthesia because of unusual scrotal sensitivity, patients who are too uncomfortable or too anxious to tolerate vasectomy under local anesthesia or patients whose vasa are especially difficult to palpate.

Qualifying Statements

Qualifying Statements

There is a continually expanding literature on vasectomy. The Panel notes that the original guideline document constitutes a clinical approach to the practice of vasectomy. This Guideline is not intended to replace the judgment of an individual clinician faced with a particular patient. As the science relevant to vasectomy evolves and improves, the strategies presented here will require updating to remain consistent with the highest standards of clinical care.

Disclaimer

While these guidelines do not necessarily establish the standard of care, the American Urological Association (AUA) seeks to recommend and to encourage compliance by practitioners with current best practices related to the condition being treated. As medical knowledge expands and technology advances, the guidelines will change. Today, these evidence-based guideline statements represent not absolute mandates but provisional proposals for treatment under the specific conditions described in each document. For all these reasons, the guidelines do not pre-empt physician judgment in individual cases.

Treating physicians must take into account variations in resources, and patient tolerances, needs, and preferences. Conformance with any clinical guideline does not guarantee a successful outcome. These guidelines are not intended to provide legal advice about use and misuse of these substances.

Although guidelines are intended to encourage best practices and potentially encompass available technologies with sufficient data as of close of the literature review, they are necessarily time-limited. Guidelines cannot include evaluation of all data on emerging technologies or management, including those that are U.S. Food and Drug Administration (FDA)-approved, which may immediately come to represent accepted clinical practices.

For this reason, the AUA does not regard technologies or management which are too new to be addressed by these guidelines as necessarily experimental or investigational.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Patient Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Sharlip ID, Belker AM, Honig S, Labrecque M, Marmar JL, Ross LS, Sandlow JI, Sokal DC. Vasectomy: AUA guideline. Linthicum (MD): American Urological Association Education and Research, Inc. (AUA); 2012 May. 57 p. [275 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 May

Guideline Developer(s)

American Urological Association Education and Research, Inc. - Medical Specialty Society

Source(s) of Funding

American Urological Association, Inc. (AUA)

Guideline Committee

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Financial Disclosures/Conflicts of Interest

All panel members completed conflict of interest (COI) disclosures. Relationships that have expired (more than one year old) since the panel's initial meeting, are listed. Those marked with (C) indicate that compensation was received; relationships designated by (U) indicate no compensation was received.

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Scientific Study or Trial: David Sokal, Family Health International (C)

Other-Employee, Owner, Product Development: David Sokal, Family Health International (C)

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the [American Urological Association, Inc. \(AUA\) Web site](#)

Availability of Companion Documents

Appendices A and D in the [original guideline document](#) provide diagrams of the no-scalpel vasectomy (NSV) technique and vas occlusion techniques.

Patient Resources

Appendix B of the [original guideline document](#) contains a sample form which physicians can use to provide vasectomy information to patients.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI Institute on July 24, 2012. The information was verified by the guideline developer on September 4, 2012.

Copyright Statement

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